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1941 FOREST INSECT SURVEY

STANISLAUS NATIONAL FOREST

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By
J. E. Patterson
Berkeley, California
December 4, 1941

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Forest Insect Laboratory
Berkeley, California
December 4, 1941

1941 FOREST INSECT SURVEY,

STANISLAUS NATIONAL FOREST

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1941 FOREST INSECT SURVEY.

STANISLAUS NATIONAL FOREST

INTRODUCTION

The 1941 forest insect survey of the Stanislaus National Forest was made during the period September 6 to 13, 1941, by staff members of the Forest Insect Laboratory, Berkeley, California. The field work was carried out by a four-man crew consisting of G. R. Struble, C. B. Eaton, H. L. McKenzie, and J. E. Patterson. Patterson is responsible for interpretation of the field data and for the general estimates.

The purpose of the survey, as in former years, was to determine the amount and character of the annual insect losses in the coniferous forests and to detect incipient epidemics that should be checked by control measures before losses become excessive.

EXTENT AND METHOD OF THE SURVEY

The survey this year was directed toward covering all insect infestations in the commercial pine and fir forests and also on the principal recreational areas where even minimum losses are damaging to esthetic values. The infestation units set up in the 1940 survey were again used without revision of boundaries. In many cases these boundaries are not entirely satisfactory since they include brush areas or alpine types. However, they have been retained in order to allow a closer comparison of current losses with those of previous years. The total gross area of the infestation units now recognized amounts to approximately 507,000 acres. Maps of the forest showing the location of all the infestation units are included in this report.

Sample plot cruises (Table I), and road strip cruises (Table II), supplemented by general topographic viewing, supplied the basic data used in estimating the total 1941 losses. No new sample plots were established although road stripping was greatly extended, thereby covering units not provided withisample plots. Two previously established sample plots, Squaw Hollow in Dorrington Unit, and Berkeley Hill in Ackerson Meadow Unit, were discarded because of logging operations which had so depleted the stands on and around them that they were of no further value as an index of the local infestation.

GENERAL INFESTATION CONDITIONS

A general decrease in pine losses over the entire forest was a marked feature of the 1941 infestation. A tendency toward decreasing losses was indicated by the 1940 survey, and Carlson pointed out at that time that decreased losses were expected to occur in 1941. However, the decrease actually occurred between the summer infestation of 1940 and the overwintering infestation of that same year. Consequently Carlson's estimates for the total 1941 loss (based on incomplete data available in the fall of 1940) was greatly in excess of the total which was visible in the fall of 1941 when it could be accurately surveyed.

During the current year's survey, fir losses were also recorded. These data show that infestations in fir have registered a different course from infestations in pine and have shown a persistent increase through recent years. This same tendency has been consistent throughout all the Sierra Nevada forests and is general over the entire region. The combined insect losses in pine and fir on the infestation units for the last two year period is estimated at 3,504 MBM in 1940 and 2,960 MBM in 1941. These totals show a reduction in losses of 16 percent inclusive of the increased losses in fir. The years pine loss has largely occurred in stands on the intermediate and higher elevations with corresponding greatly reduced losses in the marginal stands and lower elevations. The greatest reduction has occurred in ponderosa pine, with sugar pine losses remaining about static. Very little reduction in losses has occurred in the Jeffrey pine forests, and in certain areas in the high country losses of this species have slightly increased, indicating a tendency toward epidemic infestations on these areas.

The fir losses are largely confined to white fir and to the higher elevations of those units in the fir belt.

Control by direct measures was recently carried out in two units. These projects were located in Clark's Fork Unit and in Brightman Flat Unit and were directed largely against the Jeffrey pine beetle in Jeffrey pine. The success of these projects is indicated by the subsidence of the infestations in these units.

INSECTS AND HOST TREES INVOLVED.

As in previous years the mountain pine beetle, Dendroctonus monticolae, and the western pine beetle, Dendroctonus brevicomis, continue to be the principal insects responsible for losses in sugar pine and ponderosa pine. The Jeffrey pine beetle, Dendroctonus jeffreyi, has caused the greater losses in Jeffrey pine, and it is due to the increased activity of this insect that losses have multiplied in certain stands of its host in the high country. The flathead beetles, Melanophila spp., are also present in all pine infestations, but they have played a

decidedly minor role during the year. Fir losses are due in the larger measure to the activity of the fir engraver beetle, Scolytus ventralis. This beetle's initial attacks are normally made along the upper bole; successive attacks are extended farther down the stem until the tree reaches a dying condition. At this stage attacked trees are usually finished off by the roundhead, Tetropium abietis, which fills up the lower bole. Individual trees seldom die from initial attacks, but death follows successive attacks, though the process may require two to three years. These insects attack both white fir and red fir, consequently losses of these two species are recorded together in this report.

The pine engraver beetles, Ips spp., were relatively inactive during the year. All attacks recorded during the survey were confined to the tops of trees attacked by the Dendroctonus beetles.

CONDITIONS ON UNIT AREAS

The infestation units set up in 1940 were retained for measuring the 1941 losses on these local areas. The measured losses on the permanent sample plots are summarized in Table I. Losses on the surveyed road strips are given in Table II. The infestation trend during the last three year period, 1939-1941 inclusive, is indicated by comparison of these annual losses. These data, supplemented by reconnaissance counts, are the basis for the estimates of unit losses shown in Table III.

Decidedly low endemic infestations prevailed on the following units:

Folsom	Hermit Springs	Blue Mountain
Mokelumne	Dorrington	South Grove
Mt. Knight	Dry Meadow	Lyons
Long Barn	Dodge Ridge	Clavey
Confidence	Duckwall	Groveland
Buck Meadows	Bull Creek	Anderson Valley
Moss Creek	Canyon	Ackerson Meadows

The year's infestation on these units was subnormal and well below the minimum for these stands. Pine losses in the fringe type forests along the entire western limits of the forest are lower than for any year during the past decade. Fir losses in the higher elevations have slightly increased during the year, but are not abnormal.

Stanislaus Unit: Losses in sugar pine and ponderosa pine light throughout these forests. Infestations in fir have slightly increased on the headwaters of the north fork of the Stanislaus River. Infestations in Jeffrey pine have greatly increased throughout the range of this species in the unit. These infestations should be given special attention during the next survey to determine if they are approaching epidemic proportions.

Skull Creek Unit: In general infestations are abnormal in pine, showing a slight increase in Jeffrey pine. Fir losses are slightly increased but not alarming. Logging operations are in progress in the southern part of the unit. These, if continued, should absorb some of the infestation which otherwise would go into standing timber.

Smoothwire Unit: The infestations in this unit are lodged principally in mature trees of large size. Pine losses have sharply declined from the previous status. On the other hand fir losses have registered a 60 percent increase. Conditions are, however, about normal for these stands.

Dardanelle Unit: Pine losses in all species have sharply declined and are at present satisfactory. Fir losses have slightly increased, registering 25 percent above 1940.

Clark's Fork Unit: A sharp decline of 50 percent in pine losses occurred during the year. Recent control operations in this unit have resulted in a new low for the pine infestations. Fir losses in the higher elevations have slightly increased.

Brightman Flat Unit: Pine losses are down to an absolute minimum on the floor of this recreational area. Recent control work has proven its value on this area. Fir losses on the ridges surrounding the flat have increased about 50 percent. Increased activity of the Jeffrey pine beetle was noted in the high country east of the flat. Subsequent conditions here should be carefully watched.

Pinecrest Unit: Infestation conditions on this unit have not shown material change during the last three years except for a gradual increase in the activity of the mountain pine beetle in sugar pine. The loss of many mature sugar pine trees on this popular recreational area is disturbing, and if continued will result in a great depletion of the most desirable specimens. This infestation is not confined exclusively to the recreational area, but extends into the adjacent reserve of commercial stands with equal intensity. Sugar pine losses have increased 20 percent during the year. It is estimated that a total of 180 mature sugar pine trees of large size died from insect attack during the year. This loss is excessive for a recreational area and should be reduced by direct control measures. Early control is recommended for the recreational area at least, and should be extended to include the adjacent reserve stands. It is estimated that the overwintering infestation on the recreational area alone will amount to 62 large trees which should be treated before may 1942.

Cherry Valley Unit: The infestation in this unit is largely confined to fir since pine losses have materially decreased from former status. At present the small amount of infestation is lodged in trees of maximum diameters. It is expected that the decline already noticeable will continue, particularly since logging operations now in progress will absorb many attacking broods of beetles.

Jawbone Unit: Pine losses sharply declined and fir losses have not shown material increase during the year. Pine losses are confined to timber in the higher elevations and to trees of large diameters. Infestations are practically nil in the fringe type forests of the unit. Logging operations have been extended into the northeastern section where recent infestations have been heaviest.

Big Creek Unit: The southern half of this unit has been largely logged, leaving only the broken, marginal type forest available for insect attack. Since the current infestation has favored better sites, losses have reached a minimum. The permanent sample plot in this unit has been completely logged and has as a consequence been discarded.

RECOMMENDATIONS

As already pointed out,* sugar pine losses on the Pinecrest recreational area have been disturbingly high for the past two years. During 1941 there was a pronounced increase in these losses which were also extended into the adjacent reserve stands. The current infestation warrants immediate control action by direct measures to check these losses and to prevent subsequent infestations on the recreational area at least. The extension of control to include the reserve stands, where many mature seed trees have been killed, is also justifiable, but not immediately imperative. Control on this area should be accomplished by the peeling-burning method which is entirely safe during the early spring period.

A total area of 5,000 acres is involved; about 50 percent being the recreational area itself. The total overwintering infestation is estimated at 130 trees; 62 being on the intensively used recreational area. About 90 percent of these trees are sugar pines of large diameters. The best season for control operations is in the early spring, March 15 to May 1.

SUMMARY

The 1941 forest insect survey of the Stanislaus National Forest was made during the period September 6 to 13. The usual methods of extensive surveys was employed again this year. The same area formerly covered was again surveyed, and the infestation units already set up were retained.

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* Under section "Pinecrest Unit" and in letter to Supervisor J. R. Hall dated September 12, 1941.

The outstanding features of the 1941 infestation are:

a. The unusually low status of all infestations in the marginal type forests.

b. The general low losses in ponderosa pine and sugar pine in all units. These have sharply declined since 1939.

c. Concentrated infestations of the mountain pine beetle in large sugar pine on the Pinecrest recreational area and in the adjacent reserve stands.

d. Increased losses in Jeffrey pine in the high back country. These losses are due to increased activity of the Jeffrey pine beetle.

e. The generally increased losses in fir caused by the fir engraver beetles.

Control operations are recommended in the Pinecrest recreational area and in adjacent reserve stands. This work should be carried out in the spring of 1942.

TABLE I. COMPARATIVE SAMPLE PLOT LOSSES - 1939, 1940, 1941

Sample Plot	Species	1939 Number Trees	1939 Trees per Ac.	1939 Volume b.m.	1940 Number Trees	1940 Trees per Ac.	1940 Volume b.m.	1941* Number Trees	1941* Trees per Ac.	1941* Volume b.m.
Jawbone	PP	36	.11	23,840	12	.04	16,890	1	.003	6,050
(SS-2)	SP	4	.01	340	0		0	1	.003	5,840
320 acres	Total	40	.12	24,180	12	.04	16,890	2	.006	11,890
	WF				1	.003	5,470			
	Plot total	40	.12	24,180	13	.043	22,360	2	.006	11,890
Mokelumne Hill	PP	12	.04	52,430	9	.03	10,470	1	.003	9,520
(SS-4)	SP	3	.01	22,020	3	.01	25,730	2	.006	19,360
320 acres	Total	15	.05	74,450	12	.04	36,200	3	.01	28,880
	WF				3	.01	380			
	Plot total	15	.05	74,450	15	.05	36,580	3	.01	28,880
Pinecrest	SP	1	.006	3,060	2	.01	320			
(SS-5)	JP	1	.006	2,620	1	.006	1,960	1	.006	1,320
160 acres	Total	2	.01	5,680	3	.02	2,280	1	.006	1,320
	WF							2	.01	460
	Plot total	2	.01	5,680	3	.02	2,280	3	.02	1,780
Dorrington (SS-6) 40 acres	PP	3	.07	3,380	3	.07	300	0		0
Buck Meadows (SS-7) 40 acres	PP	0		0	2	.05	2,540	0		0

* 1941 overwintering losses are incomplete. Complete losses cannot be determined until June 1942.

TABLE II. UNIT ROAD STRIP LOSSES, 1940-1941

Unit	Road Strip	Species	1940 Number Trees	1940 Volume b.m.	1940 Estimated Trees per Section	1941 Number Trees	1941 Volume b.m.	1941 Estimated Trees per Section
Hermit Springs	800A	PP	3	3,450	8	1	1,800	6
		JP	2	3,200	6	2	1,200	6
Folsom	320A	PP	4	5,600	8	3	3,500	6
		JP	5	7,000	10	3	3,400	6
Mokelumne	1,550A	PP	10	16,000	8	7	12,000	5
		JP	7	10,000	6	7	10,000	5
Stanislaus	2,240A	PP	3	3,600	8	10	14,000	9
		JP	3	3,200	12	2	3,000	6
		SP	1	1,800	4	3	5,400	2
Skull Creek	1,450A	PP	4	4,800	8	6	6,000	4
		SP	1	1,600	3	1	1,700	3
Smoothwire	800A	PP	6	4,800	8	4	4,000	6
		JP	3	3,000	6	0	0	6
		SP	1	1,400	3	0	0	4
Pinecrest	1,020A	PP	12	7,200	10	7	4,900	8
		SP	2	1,600	3	5	4,000	8
Dardanelle	650A	JP	3	2,700	5	2	2,000	3
		SP	0	0	0	1	1,800	2
Brightman	400A	JP	0	0	11	1	1,400	3
Jawbone	840A	PP	2	2,400	4	1	1,300	3
Buck Meadows	1,000A	PP	6	3,500	5	3	2,400	4
Big Creek	490A	PP	1	1,500	3	2	2,400	4
Ackerson Mdw.	400A	PP	0	0	3	0	0	2

TABLE III. ESTIMATED UNIT LOSSES, 1940-1941

Unit	Area in Acres	Species	1940 No. Trees	1940 Volume BM	1941 No. Trees	1941 Volume BM
Folsom	12,480	Pine	100	60,000	140	70,000
Hermit Springs	16,180	Pine	280	190,000	240	170,000
		Fir	70	28,000	90	45,000
Mokelumne	17,400	Pine	350	525,000	250	375,000
		Fir	60	42,000	40	28,000
Blue Mtn.	16,500	Pine	120	60,000	70	40,000
		Fir	40	20,000	50	25,000
Stanislaus	27,200	Pine	600	720,000	375	560,000
		Fir	150	60,000	175	87,500
Dorrington	24,700	Pine	280	90,000	200	80,000
		Fir	120	48,000	90	27,000
South Grove	12,400	Pine	165	100,000	105	63,000
Skull Creek	21,800	Pine	275	190,000	175	120,000
Smoothwire	22,000	Pine	340	319,600	300	270,000
		Fir	100	40,000	160	76,000
Dry Meadows	14,500	Pine	150	90,000	90	55,800
Mt. Knight	25,400	Pine	60	30,000	40	25,000
Lyons	15,200	Pine	90	36,000	50	20,000
Confidence	22,000	Pine	80	40,000	60	24,000
Long Barn	15,200	Pine	50	40,000	30	22,000
Clark's Fork	6,000	Pine	40	32,000	20	16,000
		Fir	50	20,000	70	30,000
Brightman	5,800	Pine	25	10,500	10	7,000
		Fir	30	12,000	45	90,000
Dardanelle	16,300	Pine	120	96,000	90	72,000
		Fir	72	43,000	90	54,000
Pinecrest	11,500	Pine	150	97,500	180	135,000
		Fir	35	21,000	45	25,800
Dodge Ridge	23,000	Pine	100	40,000	70	28,000

Table III (continued)

Unit	Area in Acres	Species	1940 No. Trees	1940 Volume BM	1941 No. Trees	1941 Volume BM
Clavey	26,200	Pine	50	25,000	30	15,000
Cherry Valley	9,000	Pine	28	42,000	20	30,000
		Fir	60	48,000	70	55,000
Jawbone	30,200	Pine	80	96,000	60	70,000
		Fir	20	16,000	25	17,600
Canyon	10,000	Pine	10	5,000	6	3,000
Groveland	18,200	Pine	75	25,000	60	15,000
Buck Meadows	30,400	Pine	150	45,000	120	36,000
Bull Creek	19,200	Pine	60	12,000	40	8,000
Big Creek	14,200	Pine	50	25,000	45	24,500
Ackerson Meadow	17,600	Pine	60	35,000	40	24,000
Anderson Valley	12,200	Pine	50	20,000	30	15,000
Moss Creek	5,600	Pine	25	10,000	15	6,000
Totals	507,120		4,820	3,504,600	3,911	2,960,200

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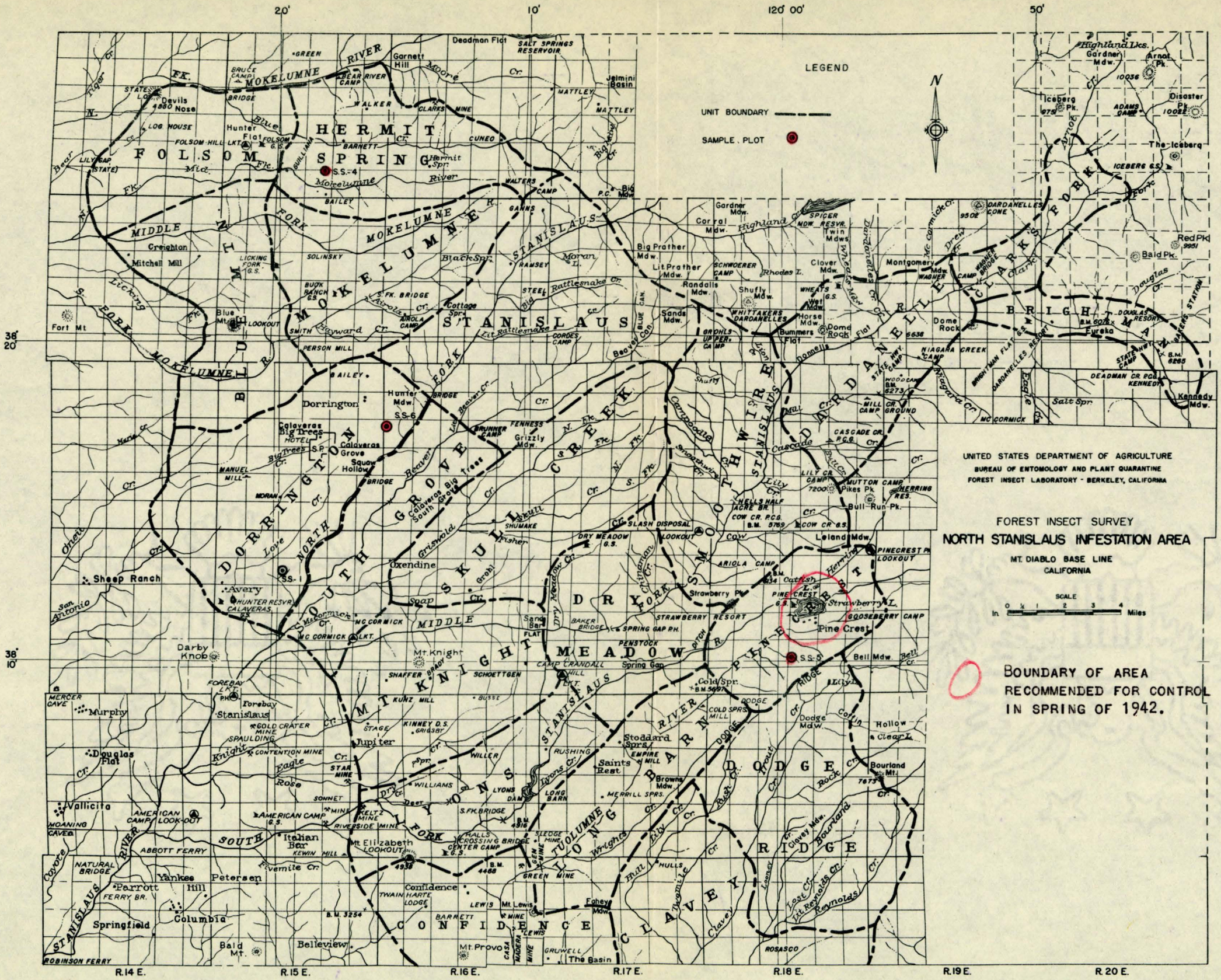
The estimated total loss, shown in Table III, on all the Units is also that for the entire forest during the last two year period. These estimates are based on primary data secured on the permanent sample plots and on the unit road strips; further amplified and corrected by topographic viewing of each unit.

In estimating the total infestation for each year of the period the number of attacked trees recorded on the sample plots and road strips served as a value for computing the amount of infestation per section which was in turn applied to the entire timbered area of each unit. These estimates, while only approximate, are the best that can be obtained in an extensive survey, and are close enough to give a reliable picture of actual infestation conditions. Since the basis is identical in each survey, the resultant estimates of yearly losses are highly comparable and show the actual trend of infestations.


20'
10'
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50'
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38° 10'
T.7 N.
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T.5 N.
T.4 N.
T.3 N.
T.2 N.
R.14 E.
R.15 E.
R.16 E.
R.17 E.
R.18 E.
R.19 E.
R.20 E.
LEGEND
UNIT BOUNDARY
SAMPLE PLOT
N
HERMIT SPRING
FOLSOM
MIDDLE FORK MOKELUMNE R.
NORTH FORK MOKELUMNE R.
MOKELUMNE RIVER
SOUTH FORK MOKELUMNE R.
MIDDLE FORK STANISLAUS
NORTH FORK STANISLAUS
SOUTH FORK STANISLAUS
CLARK FORK
BRIGHTMAN
DARDANELLES
DORRINGTON
GROVELAND
SKULL CREEK
SOUTH FORK
NORTH FORK
MT. KNIGHT
MEADOW
DRY
STANISLAUS
PINE
BARNETT
DODGE
RIDGE
CLAVEY
CONFIDENCE
YOSEMITE
TUOLUMNE
LYONS
BEAR RIVER
Deadman Flat
SALT SPRINGS RESERVOIR
Garnett Hill
Moore Cr.
Jeimini Basin
MATTLEY
Devils Nose 4880
Hunter Flat
Blue Cr.
Tiger Cr.
Bear Cr.
LILY GAP (STATE)
FOLSOM HILL LKT.
S.S.-4
Hermit Spr.
Big Meadow Cr.
Big Meadow
P.C.
WALTERS CAMP
BAILEY
GANNS
Creighton
Mitchell Mill
LICKING FORK G.S.
SOLINSKY
Black Spr.
RAMSEY
Moran L.
Rattlesnake Cr.
Lit. Rattlesnake Cr.
BUCK RANCH G.S.
S. FK. BRIDGE
Ariola Cr.
Cottage Spr.
ARIOLA CAMP
SMITH
Hayward Cr.
PERSON MILL
GORDES CAMP
Fort Mt.
Blue Mt. LOOKOUT
Licking Fk.
S. FORK
Dorrington
Hunter Mdw.
SS-6
Lit. Beaver Cr.
BRUNNER CAMP
FENNESS
Grizzly Mdw.
Calaveras Big Trees HOTEL
Calaveras Big Trees S.P.
Calaveras Grove
Square Hollow
Big Trees
MANUEL MILL
MORAN
Beaver Cr.
Big Trees
Marie Cr.
Cherry Cr.
Love Cr.
Griswold Cr.
Soap Cr.
Oxendine
SS-1
Sheep Ranch
Avery
HUNTER RESVR.
CALAVERAS B.
San Antonio
McCormick Cr.
MC CORMICK
MC CORMICK LKT.
Darby Knob
Mt. Knight
SHAFFER
BRADY
SCHOETTGEN
FOREBAY L.
FOREBAY P.H.
Forebay
Stanislaus
MERCER CAVE
Murphy
GOLD CRATER MINE
SPAULDING
CONTENTION MINE
KUNZ MILL
STAGE
KINNEY D.S.
GRIGSBY
Jupiter
Douglas Flat
Knight Cr.
Eagle Cr.
Rose Cr.
STAR MINE
WILLIAMS
WILLER
RUSHING
Spr. Cr.
Dry Cr.
Deer Cr.
SONNET MINE
KELTZ MINE
RIVERSIDE MINE
Vallecito
WOANING CAVES
AMERICAN CAMP LOOK-OUT
AMERICAN CAMP G.S.
ABBOTT FERRY
Italian Bar
KEWIN MILL
Mt. Elizabeth LOOKOUT
4938
Fivemile Cr.
NATURAL BRIDGE
Parrott Ferry Br.
Yankee Hill
Petersen
Springfield
Columbia
Bald Mt.
Belleview
ROBINSON FERRY
Coyote Cr.
Stanislaus River
Confidence
TWAIN HARTE LODGE
B.M. 3254
Mt. Provo
CASA MADERA MINE
LEWIS
Mt. Lewis
W MINE
LEWIS
GRUWELL
The Basin
B.M. 4468
HALLS CROSSING BRIDGE
CENTER CAMP
G.S.
SLEDGE MINE
GEN GRANT MINE
GREEN MINE
S.FK. BRIDGE
B.M. 4916
Lyons Cr.
LYONS DAM
LONG BARN
MERRILL SPRS.
Saints Rest
Stoddard Spr.
EMPIRE MILL
Browns Mdw.
COLD SPRS. MILL
Cold Spr.
B.M. 5697
Spring Gap
PENSTOCK
Pinoche R.
Bell Mdw.
Bell Cr.
Pine Crest
PINE CREST G.S.
Strawberry L.
Strawberry Pk.
STRAWBERRY RESORT
BAKER BRIDGE
SPRING GAP P.H.
GOOSEBERRY CAMP
PINECREST PK. LOOKOUT
Sand Bar Flat
Dry Meadow Cr.
DRY MEADOW G.S.
ARIOLA CAMP
B.M. 5434
Catfish L.
Cow Cr.
Leland Mdw.
Herring Res.
Bull Run Pk.
CASCADE CR. P.G.S.
Cascade Cr.
LILY CR. CAMP
7200
MUTTON CAMP
Pikes Pk.
HELLS HALF ACRE BR.
COW CR. P.G.S.
B.M. 5769
COW CR. G.S.
SLASH DISPOSAL
LOOKOUT
Chinaman Cr.
Hermit Cr.
Fahey Mdw.
Hull Cr.
HULLS
Wrights Cr.
Lily Cr.
Campbodie
Snowshoe
Mail Cr.
Shufly
Niagara Cr.
NIAGARA CREEK CAMP
STATE HWY. CAMP
WOOD CAMP
B.M. 6273
MILL CR. GROUND
Dardanelles Cone
9502
Dardanelles Cr.
Dardanelles Resort
McCormick Cr.
Drew Cr.
Spicer Mdw. Resvr.
Twin Mdws.
Corral Mdw.
Highland Cr.
Gardner Mdw.
Big Prather Mdw.
Lit Prather Mdw.
SCHWOERER CAMP
Rhodes L.
Randalls Mdw.
Shufly Mdw.
WHEATS G.S.
Wet Mdw.
Clover Mdw.
Montgomery Mdw.
WAGNER
WAGNER BRIDGE
CAMP
Horse Mdw.
Bummers Flat
Dome Rock
6638
WHITTAKERS DARDANELLES
GRADHLS UPPER CAMP
Sands Mdw.
BLUE CAN.
Beaver Cr.
Lion Cr.
Donnells
Donnells Flat
Highland Lks.
Gardner Mdw.
Arnot Pk.
10036
Iceberg Pk.
9751
ADAMS CAMP
Disaster Pk.
10022
The Iceberg
ICEBERG G.S.
Arnot Cr.
Red Pk.
9951
Bald Pk.
Douglas Cr.
Eureka
B.M. 6078
DOUGLAS RESORT
WATERS STATION
B.M. 6295
DEADMAN CR. P.G.S.
KENNEDY
Kennedy Mdw.
Salt Spr.
Bad Cr.
McCormick
Dodge Cr.
Dodge Mdw.
Hollow
Clear L.
Bourland Mt.
7673
Bourland Cr.
Clavey Mdw.
Rock Cr.
Trout Cr.
Rush Cr.
Lily Cr.
Clavey
Lost Cr.
Mt. Reynolds Cr.
Reynolds Cr.
Looney
ROSASCO
UNITED STATES DEPARTMENT OF AGRICULTURE
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FOREST INSECT LABORATORY - BERKELEY, CALIFORNIA
FOREST INSECT SURVEY
NORTH STANISLAUS INFESTATION AREA
MT. DIABLO BASE LINE
CALIFORNIA
SCALE
In. 0 ½ 1 2 3 4 Miles
BOUNDARY OF AREA RECOMMENDED FOR CONTROL IN SPRING OF 1942.

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FOREST INSECT LABORATORY - BERKELEY, CALIFORNIA

FOREST INSECT SURVEY

STANISLAUS-YOSEMITE INFESTATION AREA

MT. DIABLO MERIDIAN, CALIFORNIA

LEGEND

N

SCALE 0 ½ 1 2 3 4 INCHES MILES

SAMPLE PLOT

UNIT BOUNDARY

120° 00'

10'

50'

40'

38° 00'

50'

40'

T. 3 N.

T. 2 N.

T. 1 N.

T. 1 S.

T. 2 S.

T. 3 S.

R. 16 E. R. 17 E. R. 18 E. R. 19 E. R. 20 E. R. 21 E. R. 22 E.

S.S.-2 S.S.-3 S.S.-5 S.S.-7 R.S.-14